

Natural Gas and Petroleum Exploration & Production

The United States taught the world how to locate and drill for hydrocarbons. For many U.S. companies, technological innovation has meant the difference between keeping domestic oil and gas fields producing or shutting them down.

Since 1985, for example, advances in drilling, reservoir imaging and production technologies have allowed U.S. natural gas producers to increase production by 14 percent despite a 50 percent decline in wellhead gas prices. Today only 9000 wells are required to find and produce what 14,250 wells found and produced a decade ago.

Improved technologies have kept many smaller oil and gas producers in business. The Uinta Basin in southern Utah is undergoing a resurgence of drilling by independent companies because a government co-sponsored field test showed how a field about to be abandoned could be revitalized. Horizontal drilling has boosted oil production in the Austin Chalk region of Texas and because of a government-industry-university project, it is likely to do the same for independent oil companies in Michigan.

Today in the United States, independent companies - not the majors - produce more than 40 percent of the nation's domestic oil and 60 percent of our natural gas. The following are some of the technological innovations developed in the Department of Energy R&D program that have made a difference to these companies and, for many, will continue to spell the difference between success and failure in the future:

Drilling with Diamonds

One of the most important advances in drilling technology took place in 1986 when Department of Energy research produced a breakthrough bonding technique that made polycrystalline diamond drill bits commercially practicable.

Previously diamond cutting bits failed after prolonged periods of drilling because the cutting assembly would break away from the bit. "Our engineers tried for two decades to stick diamonds on drill bits, but they could never crack the code," said a vice president for an oil field service company. "The DOE scientists figured out how to do it."



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